IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re U.S. Patent Application of	)	
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Harada *et al.*	)	
	)	
Serial Number: 10/687,614	)	**Art Unit 1753**
	)	
Filed: October 20, 2003	)	
	)	
For: REMOVAL METHOD FOR COATING OF POLYMER COATED GLASS CAPILLARY TUBING AND POLYMER COATED GLASS CAPILLARY TUBING	)	**Examiner Surekha Vathyam**
	)	
Attorney Docket No. HIRA.0125	)	

Commissioner of Patents
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DECLARATION OF INVENTOR UNDER 37 C.F.R.§1.132

Sir:

I, Kunio Harada, am a co-inventor of the invention disclosed and claimed in the above identified application, and hereby declare as follows:

I have reviewed the above-referenced patent application and the claims of record, and have carefully considered the Examiner's rejection under 35 U.S.C. §102(b) based on anticipation by Zare et al. (US Patent No. 4,675,300). I respectfully disagree with the Examiner's rejection.

As a co-inventor, it is my understanding that the invention provides an electrophoresis apparatus comprising a plurality of capillaries; a voltage applier applying voltage between both ends of the capillaries; a laser light source irradiating a laser; and a fluorescent detector detecting a fluorescence emitted from inside of the capillaries, wherein each of the plurality of capillaries comprises a first region coated with a polymer, a second region having a surface of the capillary exposed for a predetermined length in the longitudinal direction, and a third region defined between the first and second regions and covered with a tapered polymer coating with a thickness that becomes thinner from the first region to the second region, and wherein a slope of the surface of the coating of the third region makes an angle of 70 degrees

or less from the first region to the second region relative to the longitudinal direction of the capillary.

The invention has the advantage of preventing stresses from concentrating on the glass tube of the capillary tube at the edge of the coating when the capillary tube is bent after the windows are processed, thereby solving the problem of easy breakage caused by a concentration of stresses at the edge of the coating upon bending the capillary tube. In other words, the tapered coating serves like a cable holder for connectors or grommets used for electric wiring (see page 21, lines 1-11). In addition, the invention is intended to avoid the problem of not being able to control temperature when using a flame to remove the coating. Specifically, burning the coating at a low temperature causes cinders, which interferes with the ability to detect fluorescence excited by laser irradiation, while burning at high temperatures deforms the glass capillary tubes that results in poor transmittance (see page 2, lines 20-26).

In contrast to the invention, the reference of Zare '300 only shows a fused-silica capillary 30 that has an opaque polyimide protective coating 31 on its outer surface that is removed with flame in order to produce a translucent section 32 (see col. 3, lines 32-37). Zare '300 is just the prior art structure discussed in the application (see for example, page 20, lines 4-9 and illustrated in Figure 10C), and has all the same problems as the prior art. In particular, the structure of Zare '300 suffers from easy breakage caused by the concentration of stresses at the edge of the coating when the capillary tube is bent, and from charring or deformation resulting from the use of a flame.

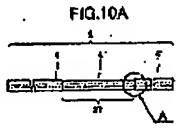
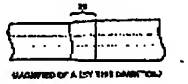
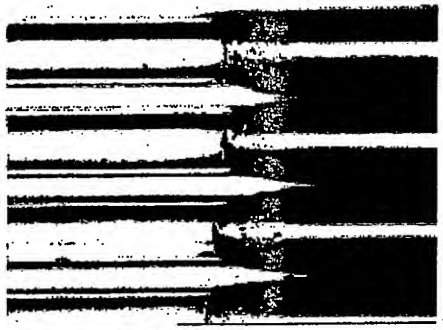
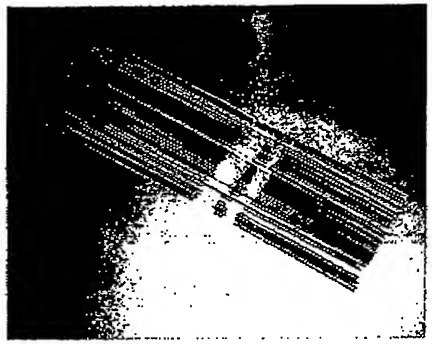
I conducted a test to confirm that the structure of Zare '300 does in fact suffer from the deficiencies in the prior art. I took conventional capillary tubes having polyimide coating in accordance with capillary tubes as disclosed in Zare '300 and exposed them to flame to remove the coating. The conditions and results of the tests I conducted are outlined in the attached chart, including photographs of the capillary tubes after being exposed to flame. The capillary with 0.18mm outer diameter and the capillary with 0.36mm outer diameter are "TSP050192" and "TSP050375", respectively, purchased from Polymicro Technologies, LLC. The results of the test show that (1) using flame to remove the coating can only result in a rough and charred edge to the coating; (2) such an edge is at best at an angle of 90 degrees relative to the longitudinal direction of the capillary; (3) and to the extent that Zare '300 discloses the structure of the capillary tube, it is not capable of forming a structure even remotely similar to the present invention.

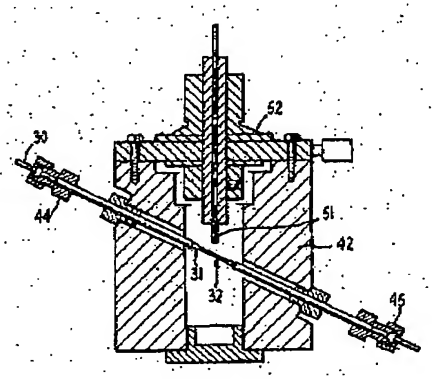
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statement were made with the knowledge that willful false statements and the like so made are punishable by fine, or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above-captioned application and any patent to issue thereon.

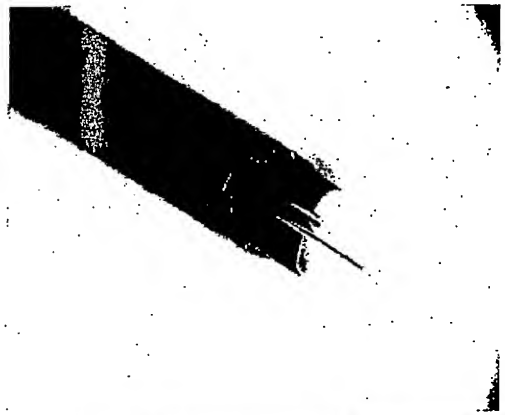
Respectfully submitted this 6 of August 2007

Kunio Harada

US Application 10/687614

	Disclosure	Photograph of product	Relation between disclosure & product
Our invention (Claim 1, Fig.10)	FIG.10A  FIG.10B  FIG.10C  each of capillaries comprising a first region where it is coated with a polymer, a second region where a surface of the capillary being exposed for a predetermined length in the longitudinal direction, **and a third region provided between the first and second regions, covered with a tapered polymer coating whose thickness becomes thinner from the first region to the second region, wherein a slope of the surface of the coating of the third region makes an angle of 70 degrees of less with the longitudinal direction of the capillary**	 Shot on Dec.2000  Shot on Feb.2000 -Capillary, coating is made of fused-silica, polyimide, respectively. -Outer diameter is about 0.18mm, thickness of coating is about 0.015mm. -Produced on according to the method disclosed in the application.	A second region (window) is made by chemical reaction between polyimide with O_3 gas introduced into the chamber. According to this, the shape of "**covered with a tapered polymer coating whose thickness becomes thinner from the first region to the second region**" is obtained. Therefore, this shape is not obvious and not the matter which one of cordially skill in the art would have been motivated to do.

	Disclosure	Photograph of product	Relation between disclosure & product
Zare (Fig.4, Col.3 lines 31-36)	 FIG.4 ... a fused-silica capillary 30 (Hewlett-Packard Co.) which was 75 cm in total length and which had a 75 ▫m inside diameter. The capillary had an opaque polyimide protective coating 31 **on its outer surface, a section of which was removed with flame to give a translucent section 32.**	 Shot on Feb. 2001. -Capillary, coating is made of fused-silica, polyimide, respectively. -Outer diameter is about 0.36mm, thickness of coating is about 0.015mm. -Coating is removed with the flame of the lighter by the inventor.	The portion corresponding to the third region in our invention in the photograph is the portion of dark brown color. Polyimide becomes fragile and easy to remove when it is burned by flame. The section of removal is enough burned and chipped, shaped as angular. Therefore, in burning with flame, the section of removal is to be angular. Zare made the translucent section by removing polyimide protective coating with flame. Thus, the section of removal is to be angular as same as shown in the photograph. Fig.4 just shows the figure of the section of removal in the inaccurate manner.

		  -Capillary, coating is made of fused-silica, polyimide, respectively. -Outer diameter is about 0.36mm, thickness of coating is about 0.015mm. -Purchased on Jul. 1999 from PE Applied Bioscience. -Shot on Dec.2000.	

Inventor: Kunio Harada